REMARKS

Claims 1-2, 5-6, 8, 12-13, 17, 20-27, 29, 31, 35 and 36 stand rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,504,603 (Winker et al) in view of US 2004/0184150 A1 (Johnson et al) and US 2004/0051831 A1 (Yu et al). According to the Examiner:

> Regarding claims 1 and 2, the X-layers have a property of O-plate and the Z-layer has a property of negative C-plate with larger negative Δn_{th} than –0.005 according to the specification (see paragraph 0039).
>
> Winker discloses (col. 4, line 2-col. 5, line 65; Figs. 1-2, 8) and a liquid crystal cell using one or more optical compensating elements (multilayer optical compensation film) comprising O-plate (X-layer) (positive birefringent material) (see col. 7, line 58 – col. 8, line 5) and negative C-plate (Z-layer) (see col. 4, lines 39-58), and the O-plate has its optic axis tilted with respect to the plane of the multilayer compensation film (oblique angle with respect to the plane of the display, see col. 7, lines 61-65).
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> Winker does not explicitly show the layer Z satisfies two relations:
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> 1) $|nx-ny| < 0.001$;
>
> 2) $\Delta n_{th} = nz-(nx+ny)/2 < -0.005$;
>
> but it would have been obvious as the property of such amorphous polymer C-plate.
>
> As evidence, Johnson teaches that in order to improve the viewing angle characteristics of the display using polymeric optical film as optical compensators (see paragraphs 0007, 0008), in which C-plate such as in Fig. 1, nx – ny, so that $|nx-ny| = 0$ that would be less than 0.001 (see paragraph 0023); and an absolute value of an out-of-plane retardation of 55nm or greater, and the layer has a thickness of 10μm to 50μm (see paragraph 0011), because the term "out-of-plane retardation" refers to the product of the birefringence (the difference of the index of refraction) times the thickness of the layer (see paragraph 0034), so that the out-of plane birefringence Δn_{th} would be the range of 0.0011 to 0055, and such negative value range would overlap the value less than –0.005. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. (see MPEP 2144.05-I.)
>
> Johnson further teaches that any polymeric material capable possessing the optical properties as optical film (compensation film) and also forming a non-crystalline (amorphous polymer) (see paragraphs 0043-0047), and using such compensation layers to improve the viewing angle characteristics of the display (see paragraphs 0007, 0008).

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the multilayer compensation film of Winker with the teachings of using such C-plate having nx = ny and having an out of –plane birefringence as taught by Johnson, since the skilled I the art would be motivated for improving the viewing angle characteristics of the display (see paragraphs 0007, 0008).

Winker and Johnson teach the invention set forth above except for that the layer Z (C-plate) having a polymer with glass transition temperature above 180°C.

Yu discloses (paragraph 0102) that the retardation film (compensation film) is prepared from polymer at a temperature above the glass transition temperature, and the polymer should preferably be selected such that its glass transition or melting temperature is significantly higher than the operating temperature of the retarder, so as to leave a solid polymer, otherwise it would be melted; and such method and suitable material are known to those skilled in the art.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the multilayer compensation film of Winker and Johnson with the teachings of the polymer applied at a temperature above its glass transition temperature as taught by Yu, since the skilled in the art would be motivated for leave a solid polymer (see paragraph 0102).

Applicants respectfully disagree with the Examiner's conclusion that the claimed invention rendered obvious by the cited combination of references. Winker suggests the possibility of using combinations of plates in developing a compensator. He suggests compensators for LCs having an azimuthal twist employing both an "O" plate and a "C" plate. However there is no suggestion of using a negative "O" plate having a highly negative out of plane birefringence (Δn_{th} = nz-(nx+ny)/2<-0.005) Winker is silent about the use of a highly negative C plate as suggested in the equation (2) of the claims. Winker is also silent about the Z layer comprising an amorphous polymer with a Tg above 180°C.

These defects are not overcome by the secondary references. Johnson is not directed to compensators using a combination of layers as in the present invention. Consequently, he does not suggest the combination use of his "C" plate. Further, his "C" plate may be either positive or negative and there is no suggestion of what to use in a combination of the invention. Finally, although Johnson suggests a range of absolute values of retardation that could, if used with the proper "O" plate, and assuming the proper selection of the sign and the proper

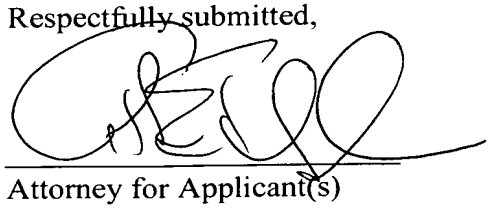
thickness, be calculated to be within the equations and other limitations of claim 1, the present rejection is not rendered obvious by the mere overlap of one claim limitation due to the other distinctions. The present instance is not one where the sole distinction is a partial overlap of a range with that of a single reference. The present invention requires the selection of a "C" plate of a certain sign and a certain minimum negative birefringence together with an "O" plate. Although the Examiner correctly points out that if one (1) selects the disclosure of an absolute value of out-of-plane retardation of 55nm or greater, (2) presumes a negative sign, and then (3) combines these with a teaching of a thickness selection of 50 μ from the range of 10 to 50 μ, then one can calculate a retardation of as negative as --0.0055. But one can much more easily calculate from the same reference birefringence values outside the scope of the equation (2) of the claim. In fact, the only way to get a value for equation (2) of more negative than -0.005 is to choose a thickness of less than 11μm from the range of 10-50μm. In any event, there remains the absence of any motivation to combine with an "O" plate and select a highly negative birefringence.

Neither Winker nor Johnson provides any motivation to select the high negative "C" plate in the combination compensator. Johnson appears to treat the sign and the birefringence of the "C" plate as independent variables without any reference to selection of a desired range for their use in the claimed combination. there is no motivation at arrive at this selection.

The reference Yu is relied on to teach (paragraph 0102) that the retardation film (compensation film) is prepared from polymer at a temperature above the glass transition temperature. There is no motivation to make the linkage of this disclosure to the combination of the invention.

In view of the foregoing remarks, the Examiner is respectfully requested to withdraw the outstanding rejection and to pass the subject application to Allowance.

Respectfully submitted,



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